Freeform Search

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Term: L61 same 153 not 13

Display: 20 **Documents in Display Format:** - **Starting with Number** 1

Generate: ○ **Hit List** ◉ **Hit Count** ○ **Side by Side** ○ **Image**

Search Clear Interrupt

Search History

DATE: Monday, January 29, 2007 Purge Queries Printable Copy Create Case

Set Name side by side	Query	Hit Count	Set Name result set
DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=ADJ			
L62	L61 same l53 not l3	87	L62
L61	diabetes	103174	L61
L60	L59 not l3	1	L60
L59	L58 and l53	32	L59
L58	herb	27236	L58
L57	l6 and l53 not l3	3	L57
L56	l48 and l15	1	L56
L55	L54 and l48	0	L55
L54	L53 not l3	233	L54
L53	hemoglobin A1c or HbA1c	959	L53
L52	l49 and plant not l3	36	L52
L51	L49 and l48 not l3	0	L51
L50	L49 same l48 not l3	0	L50
L49	serine carboxypeptidase	446	L49
L48	rosaceae or vitaceae or umbelliferae	1894	L48
L47	l45 not l3	30	L47

L46	l45 and l6 not l3	2	L46
L45	L44 same l23	56	L45
L44	L43 same l4	224	L44
L43	remove near2 sugar	1435	L43
L42	L41 not l3	3	L42
L41	defruct$	18	L41
L40	L39 not l3	10	L40
L39	lose near3 fructose	11	L39
L38	L11 not l3	15	L38
L37	l34 and l21 not l3	4	L37
L36	L35 not l3	0	L36
L35	L34 and l15	5	L35
L34	L33 same l4	7424	L34
L33	fructos$	48838	L33
L32	L31 and l23	20	L32
L31	l4 and l21 not l3	21	L31
L30	l4 and l21 not l3	21	L30
L29	l4 and l21 not l3	21	L29
L28	L27 not l3	0	L28
L27	(fructosylated peptide)or (fructosylated protein)	5	L27
L26	L25 same l23	2	L26
L25	L24 not l3	43	L25
L24	l15 or l21	76	L24
L23	enzyme	373926	L23
L22	L21 and l6 not l3	1	L22
L21	remove near2 l5	59	L21
L20	l15 and l6 not l3	0	L20
L19	l18 and l5	1	L19
L18	L17 not l3	2	L18
L17	l14 and l6	2	L17
L16	L15 not l3	2	L16
L15	defructos$	17	L15
L14	L13 not l3	15	L14
L13	L12 or l11	30	L13
L12	defructosylation	3	L12
L11	fructosylated	29	L11
L10	l7 same l6 not l3	19	L10
L9	L8 not l3	129	L9
L8	L7 and l6	470	L8
L7	l4 same l5	6259	L7
L6	plant near2 extracts	25521	L6

L5	fructose	45165	L5
L4	peptide or protein	596872	L4
L3	@pd>20021023	8437209	L3
L2	@pd?20021023	0	L2
L1	pd@20021023	0	L1

END OF SEARCH HISTORY

Glycosylation

From Wikipedia, the free encyclopedia
(Redirected from Glycosylated)

Glycosylation is the process or result of addition of saccharides to proteins and lipids. The process is one of four principal co-translational and post-translational modification steps in the synthesis of membrane and secreted proteins and the majority of proteins synthesized in the rough ER undergo glycosylation. It is an enzyme-directed site-specific process, as opposed to the non-enzymatic chemical reaction of glycation. Two types of glycosylation exist: ***N*-linked glycosylation** to the amide nitrogen of asparagine side chains and ***O*-linked glycosylation** to the hydroxy oxygen of serine and threonine side chains.

Contents

Purpose

The polysaccharide chains attached to the target proteins serve various functions. For instance, some proteins do not fold correctly unless they are glycosylated first. Also, polysaccharides linked at the amide nitrogen of asparagine in the protein confer stability on some secreted glycoproteins. Experiments have shown that glycosylation in this case is not a strict requirement for proper folding, but the unglycosylated protein degrades quickly. Glycosylation may play a role in cell-cell adhesion (a mechanism employed by cells of the immune system), as well.

Mechanisms

There are various mechanisms for glycosylation, although all share several common features:

- Glycosylation is an enzymatic process
- The donor molecule is an activated nucleotide sugar
- The process is site-specific.

N-linked glycosylation

N-linked glycosylation is important for the folding of some of eukaryotic proteins. The *N*-linked glycosylation process occurs in eukaryotes and widely in archaea, but very rarely in bacteria.

For *N*-linked oligosaccharides, a 14-sugar precursor is first added to the asparagine in the polypeptide chain of the target protein. The structure of this precursor is common to most eukaryotes, and contains 3 glucose, 9 mannose, and 2 *N*-acetylglucosamine molecules. A complex set of reactions attaches this branched chain to a carrier molecule called dolichol, and then it is transferred to the appropriate point on the polypeptide chain as it is translocated into the ER lumen.

There are two major types of *N*-linked saccharides: high-mannose oligosaccharides, and complex oligosaccharides (Alberts et. al., Ch 13, pg 604). High-mannose is, in essence, just two *N*-acetylglucosamines with many mannose residues, often almost as many as are seen in the precursor oligosaccharides before it is attached to the protein. Complex oligosaccharides are so named because they can contain almost any number of the other types of saccharides, including more than the original two *N*-acetylglucosamines. Proteins can be glycosylated by both types of oligos on different portions of the protein. Whether an oligosaccharide is high-mannose or complex is thought to depend on its accessibility to saccharide-modifying proteins in the Golgi. If the saccharide is relatively inaccessible, it will most likely stay in its original high-mannose form. If it is accessible, then it is likely that many of the mannose residues will be cleaved off and the saccharide will be further modified by the addition of other types of group as discussed above.

The oligosaccharide chain is attached by oligosaccharyl transferase to asparagine occurring in the tripeptide sequence Asn-X-Ser or Asn-X-Thr, where X could be any amino acid except Pro. This sequence is known as a glycosylation *sequon*. After attachment, once the protein is correctly folded, the three glucose residues are removed from the chain and the protein is available for export from the ER. The glycoprotein thus formed is then transported to the Golgi where removal of further mannose residues may take place. However, glycosylation itself does not seem to be as necessary for correct transport targeting of the protein, as one might think. Studies involving drugs that block certain steps in glycosylation, or mutant cells deficient in a glycosylation enzyme, still produce otherwise-structurally-normal proteins that are correctly targeted, and this interference does not seem to interfere severely with the viability of the cells. Mature glycoproteins may contain a variety of oligomannose *N*-linked oligosaccharides containing between 5 and 9 mannose residues. Further removal of mannose residues leads to a 'core' structure containing 3 mannose, and 2 *N*-acetylglucosamine residues, which may then be elongated with a variety of different monosaccharides including galactose, *N*-acetylglucosamine, *N*-acetylgalactosamine, fucose and sialic acid.

O-linked glycosylation

O-N-acetylgalactosamine (*O*-GalNAc)

O-linked glycosylation occurs at a later stage during protein processing, probably in the Golgi apparatus. This is the addition of N-acetyl-galactosamine to serine or threonine residues by the enzyme *UDP-N-acetyl-D-galactosamine:polypeptide N-acetylgalactosaminyltransferase*, followed by other carbohydrates (such as galactose and sialic acid). This process is important for certain types of proteins such as proteoglycans, which involves the addition of glycosaminoglycan chains to an initially unglycosylated "proteoglycan core protein." These additions are usually serine *O*-linked glycoproteins, which seem to have one of two main functions. One function involves secretion to form components of

the extracellular matrix, adhering one cell to another by interactions between the large sugar complexes of proteoglycans. The other main function is to act as a component of mucosal secretions, and it is the high concentration of carbohydrates that tends to give mucus its "slimy" feel. Proteins that circulate in the blood are not normally *O*-glycosylated, with the exception of IgA1 and IgD (two types of antibody) and C1-inhibitor.

O-fucose

O-fucose is added between the second and third conserved cysteines of EGF-like repeats in the Notch protein, and possibly other substrates by GDP-fucose protein *O*-fucosyltransferase 1, and to Thrombospondin repeats by GDP-fucose protein *O*-fucosyltransferase 2. In the case of EGF-like repeats, the *O*-fucose may be further elongated to a tetrasaccharide by sequential addition of N-acetylglucosamine (GlcNAc), galactose, and sialic acid, and for Thrombospondin repeats, may be elongated to a disaccharide by the addition of glucose. Both of these fucosyltransferases have been localized to the endoplasmic reticulum, which is unusual for glycosyltransferases, most of which function in the Golgi apparatus.

O-glucose

O-glucose is added between the first and second conserved cysteines of EGF-like repeats in the Notch protein, and possibly other substrates by an unidentified *O*-glucosyltransferase.

O-*N*-acetylglucosamine (*O*-GlcNAc)

O-GlcNAc is added to serines or threonines by *O*-GlcNAc transferase. *O*-GlcNAc appears to occur on serines and threonines that would otherwise be phosphorylated by serine/threonine kinases. Thus, if phosphorylation occurs, *O*-GlcNAc does not, and *vice versa*. This is an incredibly important finding because phosphorylation/dephosphorylation has become a scientific paradigm for the regulation of signaling within cells. A massive amount of cancer research is focused on phosphorylation. Ignoring the involvement of this form of glycosylation which clearly appears to act in concert with phosphorylation means that a lot of current research is missing at least half of the picture. *O*-GlcNAc addition and removal also appear to be key regulators of the pathways which are deregulated in diabetes mellitus. The gene encoding the *O*-GlcNAc removal enzyme has been linked to non-insulin dependent diabetes mellitus. It is the terminal step in a nutrient sensing hexosamine signaling pathway.

GPI anchor

A special form of glycosylation is the *GPI anchor*. Although this is a form of glycosylation, the result is a hydrophobic side chain, making GPI anchoring quite similar to prenylation.

C-mannosylation

A mannose sugar is added to tryptophan residues in Thrombospondin repeats. This is an unusual modification both because the sugar is linked to a carbon rather than a reactive atom like a nitrogen or oxygen and because the sugar is linked to a tryptophan residue rather than an asparagine or serine/threonine.

Refine Search

Search Results -

Term	Documents
((13 SAME 4) NOT 3).PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD.	0
(L13 SAME L4 NOT L3).PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD.	0

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IBM Technical Disclosure Bulletins

Search: L15

Refine Search

Recall Text | Clear | Interrupt

Search History

DATE: Monday, January 29, 2007 **Purge Queries** Printable Copy Create Case

Set Name side by side	Query	Hit Count	Set Name result set
DB=PGPB,USPT,USOC,EPAB,JPAB,DWPI,TDBD; PLUR=YES; OP=ADJ			
L15	l13 same l4 not l3	0	L15
L14	L13 and l12	66	L14
L13	deglycosylation	4423	L13
L12	L11 and l3	109	L12
L11	deglycosylat$	6253	L11
L10	L9 same l3	1	L10
L9	plant or herb	873071	L9
L8	l3 and enzyme	102	L8
L7	L6 and l3	0	L7
L6	(hemoglobin A1c) or HbA1c	959	L6
L5	L4 same l3	1	L5

L4	plant near2 extracts	25521	L4
L3	l1 not L2	109	L3
L2	@pd>20021023	8437209	L2
L1	(deglycosylated peptide) or (deglycosylated protein)	232	L1

END OF SEARCH HISTORY